PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	see from PCT/ISA/210 (page 2)
Applicant's or agent's file reference: see form PCT/ISA/220	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/EP2004/050466	4/7/2004	6/18/2003

International Patent Classification (IPC) or both national classification and IPC
H04L12/40

Applicant
ROBERT BOSCH GMBH

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☑ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☑ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/	Authorized officer
European Patent Office Munich	Jaskolski, J
Facsimile No.	Telephone No.

Form PCT/ISA/237 (cover sheet) (January 2004)
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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/EP2004/050466

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material

   ☐ a sequence listing

   ☐ table(s) related to the sequence listing

   b. format of material

   ☐ in written format

   ☐ in computer readable form

   c. time of filing/furnishing

   ☐ contained in the international application as filed.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE
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International application No.
PCT/EP2004/050466

Box No. II Priority

1. ☑ The following document has not yet been furnished:

   ☑ copy of the earlier application whose priority has been claimed (Rules 43*bis*.1 and 66.7(a)).

   ☐ translation of the earlier application whose priority has been claimed (Rules 43*bis*.1 and 66.7(b)).

   Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/EP2004/050466

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	9-12,14	YES
	Claims	1-8,13,15,16	NO
Inventive step (IS)	Claims		YES
	Claims	9-12,14	NO
Industrial applicability (IA)	Claims	1-16	YES
	Claims		NO

2. Citations and explanations:

see supplemenatry page

Re: Point V.

1 In this Report, reference is made to the following documents:

D1: US 2002/067737 A1 (WEGO ARILD) June 6th 2002 (2002-06-06)

D2: EP-A-0 522 607 (ERICSSON TELEFON AB L M) January 13th 1993 (1993-01-13)

D3: US 2003/070019 A1 (DALAKURAS LAMBROS ET AL) April 10th 2003 (2003-04-10)

D4: EP-A-0 622 712 (ALLEN BRADLEY CO) November 2nd 1994 (1994-11-02)

D5: US-B-6 516 3641 (BOTT WOLFGANG ET AL) February 4th 2003 (2003-02-04)

D6: US-A-6 111 888 (HAYS PAUL J ET AL) August 29th 2000 (2000-08-29)

D7: LEEN G ET AL: "TTCAN: a new time-triggered controller area network" MICROPROCESSORS AND MICROSYSTEMS, IPC BUSINESS PRESS LTD. LONDON, GB, Vol. 26, No. 2, March 17th 2002 (2002-03-17), pages 77-94, XP004339936 ISSN: 0141-9331

2. Claims 1 to 3, 7, 15 and 16 are not clear, Article 6 PCT. The feature "duration of the pause period is corrected" is unclear regarding the meaning of the word "corrected". The claims do not define any circumstances requiring a "correction" in the sense of elimination of error. The word "corrected" is therefore vague and can be interpreted only in the sense of an "alteration".

3. It is apparent from page 3, lines 23 to 26 that the following features are essential to the definition of the invention:

a) co-operation of two or more bus systems that are

coupled to one another, which requires synchronization.

b) synchronization is achieved by time deviation, especially delay, on one of the bus systems.

Since the independent claims 1, 15 and 16 do not contain those features, they do not comply with the requirement of Article 6 PCT in conjunction with Rule 6.3b) PCT that each independent claim must contain all the technical features essential to the definition of the invention. Those features also make the term "correction" (see Section 2) understandable, in the sense of elimination of error propagation, in accordance with the description, page 8, lines 23 to 26, page 11, lines 8 to 11.

4. Insofar as claim 1 can be interpreted (see Section 2), the subject-matter of claim 1 is not new within the meaning of Article 33(1) and (2) PCT. Document D1 discloses all the features of claim 1 (the references in brackets are to that document):

Method for exchanging data in messages between at least two stations (paragraph 2, lines 9-10: "transmitters and receivers that are communicating via the TDM-bus") connected via a bus system (TDM-bus), the messages containing the data being transmitted by the stations over the bus system (paragraph 2, lines 13-15: "in each timeslot TS data may be transmitted") and the messages being controlled over time by a first station in such a manner that the first station repeatedly transmits a reference message (Figure 4: frame synchronisation signal FS_S) containing time information of the first station over the bus system (paragraph 20: "the communication takes place on a TDM bus with a synchronisation master SM

supplying the frame synchronisation signals FS") at at least one specifiable time interval (Figure 4), the time interval being subdivided as a basic cycle into time windows of specifiable length (Figure 4) and the messages being transmitted in the time windows (paragraph 2, lines 13-15: "in each timeslot TS data may be transmitted"), wherein, when data is exchanged, a pause of variable duration (paragraph 24: "select the frequency of the data clock oscillator so that the number of periods within a frame is always **at least one more** than the number of timeslots required") is provided at the end of at least one basic cycle (paragraph 24: " the number of periods within a frame is always at least more than the number of timeslots required - this results in a dummy time period with no data content within each frame";), by which a time change of the beginning of the basic cycle is corrected by adaptation of the duration of the pause period (paragraph 26: "the first timeslot comes on a known time right after the frame synchronisation signal, and so that the dummy time period is at the end of the frame after all the timeslots have been transmitted").

5. The independent claims 15 and 16 respectively define a device and a system for carrying out the method as recited in claim 1 and all of the device features of those claims correspond to the method features of claim 1. The subject-matter of claims 15 and 16 is therefore not new within the meaning of Article 33(1) and (2) PCT.

6. The dependent claims 2 to 12 do not contain any features that, in combination with the features of any of the claims to which they are appended, satisfy the requirements of Article 33 PCT with regard to novelty and inventive step. The reasons for this are as follows:

a) the features of claims 2 to 8 are known from document D1, see especially Figure 4 and paragraphs 18 and 20 to 27. The second bus is PDH network. Since, in D1, the pause is provided at the end of every cycle, it is also provided at the end of every 2^nth cycle and every 2^n+1th cycle. The subject-matter of claims 2 to 8 is therefore not new within the meaning of Article 33(1) and (2) PCT.

b) the features of claims 9 to 12 form part of the general knowledge of the person skilled in the art, see especially document D2. The subject-matter of claims 9 to 12 does not, therefore, involve an inventive step within the meaning of Article 33(3) PCT.

7. Dependent claim 13 is unclear, Article 6 PCT. The claim defines that "pause periods for exchanging data are provided", which is inconsistent with the definition of the "pause", see the description, page 12, lines 24-26: "that pause period (...) is not available for communication over the bus". Notwithstanding, document D3 discloses all of the features of claim 13 (the references in brackets are to that document):

Method for exchanging data in messages between at least two stations (paragraph 1: "a bus system that has at least two users") connected via a bus system (Figure 1: bus 100), the messages containing the data being transmitted by the stations over the bus system (paragraph 2: "the communication between ... users ... may occur ... via a bus or a bus system") and the messages being controlled over time by a first station in such a manner that the first station repeatedly transmits a reference message (paragraph 3: "at the beginning of each message frame, the master sends synchronisation

information, the so-called SynchBreak (...) The SynchField follows the SynchBreak. In this case the master sends a hexadecimal pattern to enable the slave to be synchronised (...). The next information field InentField provides information about the content and the length of the subsequent data fields and hence the message frame") containing time information of the first station (paragraph 3: "the master sends a hexadecimal pattern to enable the slave to be synchronised, for example with aid of trailing edges, recessive toward dominant"; paragraphs 22, 23) over the bus system at at least one specifiable time interval (Figure 2: MessageFrame 1 to 3), the time interval being subdivided as a basic cycle into time windows of specifiable length (Figure 2: DataField, InformationSlots) and the messages being transmitted in the time windows (paragraph 25: "data fields are depicted from t24 to t25, from t25 to t26 and from t27 to t28"), wherein, when data is exchanged, a pause of variable duration (Figure 2: IS1, IS2, ISn - the number may vary) is provided at the end of at least one basic cycle (paragraph 26: "a time is reserved after a message frame for the information slots or information sections"), by which a time change of the beginning of the basic cycle is corrected by adaptation of the duration of the pause period (paragraph 27: "if a slave ... has entered a SynchBreak in the information slots ... the following information sections are not [sic] longer implemented") and at least two pause periods are provided in the case of at least two basic cycles for exchanging data (paragraph 6: "following each closed message frame a number of information sections, information slots IS, may be provided in which the at least one subordinate user may enter information") and the correction value is distributed over the at least two pause periods in a

specifiable manner (Figure 2).

eginning of the basic cycle. Although the "IS Slots" are provided for exchanging data, as they are in claim 13, they may also, however, be left empty by the associated users, which means a pause on the bus.

meaning of Article 33(1) and (2) PCT.

8. The subject-matter of dependent claim 14 does not involve an inventive step within the meaning of Article 33(3) PCT. Although document D3 does not disclose a specific length of the pause periods, it is regarded as a customary measure to adjust the duration of the pause periods, and in that matter arrive at the subject-matter of claim 14 without inventive effort.